

# TRANSURETHRAL INCISION/RESECTION OF THE PROSTATE (TUIP/TURP) IN OPERATIVE TREATMENT OF REPEATED BLADDER OUTLET OBSTRUCTION EARLY AFTER KIDNEY TRANSPLANTATION

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**SUMMARY** – The aim of the study was to assess the incidence and etiology of repeated bladder outlet obstruction (BOO) after kidney transplantation and to analyze the results of transurethral incision of the prostate/transurethral resection of the prostate (TUIP/TURP) in the early period after kidney transplantation. The study included 24 male patients having undergone renal transplantation and early transurethral surgery for BOO in our institution between 2005 and 2011. TUIP or TURP was performed depending on the etiology of BOO. The indications for transurethral surgery were repeated urinary retention despite therapeutic attempts with alpha-receptor antagonists, or repeated residual urine with renal transplant dysfunction and/or consequent urinary tract infection. Preoperative assessment included past medical history, clinical examination, PSA, volume of residual urine estimated with ultrasound, and urinary culture. Among 345 male patients having undergone renal transplantation, repeated BOO was noted in 24 patients. TUIP was performed in 19 and TURP in five patients. The mean age of our patients was 52 (range, 33-73) years and the mean time on dialysis 7.43 years (range, 4 months to 25 years). The procedure was performed on the mean of day 16 (range, 14-29) after transplantation and urethral catheter was removed on the mean of day 3.3 (range, 2-9) after the procedure. The etiology of BOO was bladder neck contracture in nine and benign prostatic hyperplasia in 15 patients. In all patients, surgical procedures were performed without any complication. Restoration of urinary bladder function was complete in all patients. In conclusion, early transurethral treatment of repeated BOO is a safe procedure with excellent results following renal transplantation.

**Key words:** *Renal transplantation; Prostatic hyperplasia; Urinary bladder neck obstruction; Transurethral resection of prostate*

## Introduction

The incidence of benign prostatic hyperplasia (BPH) increases with age, and more than 50% of men have histologic evidence of BPH by age 60<sup>1</sup>. Over the last decade, an increased proportion of renal trans-

plant recipients older than 60 have been recorded, with the majority of them receiving transplant through the Eurotransplant Senior Program, which allocates kidneys from elderly donors to equally old recipients. Thus, the number of transplanted male patients with postoperative voiding dysfunction is increasing. If left untreated, BPH poses the risk of numerous complications including acute urinary retention, recurrent urinary tract infections, and allograft failure.

The risk factors that have an important role in repeated urinary retention after kidney transplantation

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include occult BPH, bladder neck contracture, urethral strictures, dysfunctional bladder, urinary infections, diabetes, and neurologic disorders. In some patients, urinary obstruction can be detected by pretransplant screening, but many patients do not develop symptoms until urine flow is restored after transplantation. In most of these patients, selective alpha-adrenergic receptor antagonists are effective in preventing next episodes of urinary retention. However, in some renal transplant recipients, urinary retention is repeated despite the use of alpha-adrenergic blockers.

The aim of this study was to assess the incidence of repeated bladder outlet obstruction (BOO) after kidney transplantation, and to analyze the results of transurethral incision of the prostate (TUIP)/transurethral resection of the prostate (TURP) in the early posttransplant period.

## Patients and Methods

From January 2005 to January 2011, renal transplantation was performed in 345 male patients with end stage renal disease at Zagreb University Hospital Center. Our study included 24 patients having undergone renal transplantation and transurethral surgical procedure for repeated BOO in the early posttransplant period. Preoperative assessment included past medical history, clinical examination, PSA, prostate volume and residual urine volume estimation with ultrasound (US). Renal transplant technique was performed with extraperitoneal approach and end to side anastomosis of the donor to the recipient iliac vessels. Ureteral implantation to the bladder was performed in an extravesical antireflux technique with double-J catheter for 6-8 weeks. In patients with pretransplant diuresis, urethral catheter was removed on postoperative day 8. In cases of urinary retention or residual urine with transplant dysfunction and/or urinary tract infection, urethral re-catheterization was done and therapy with selective alpha-adrenergic antagonists was started. The next attempt at catheter removal was made three days after the introduction of alpha-adrenergic blocker therapy. In patients that had been anuric before transplantation, alpha-adrenergic blockers were administered from posttransplant day 8, and urethral catheter was removed on posttransplant day 11. The indications for TUIP were repeated urinary reten-

tion despite therapeutic attempts with alpha-receptor blockers, or residual urine with renal transplant dysfunction and/or urinary tract infection. In all patients, independently of prostate volume, complete opening of the bladder neck was obtained. TURP was reserved for patients with prostatic median lobe. In all patients, initial immunosuppression consisted of cyclosporine (at doses of 150-200 µg/mL), mycophenolate mofetil (2x1 g) and steroids. Follow-up was restricted to the first 120 days of transplantation. Descriptive statistical analysis was performed.

## Results

Among 345 transplanted male patients, data were analyzed for 24 patients (mean age 52, range 33-73) with repeated urinary retention despite therapeutic attempts with alpha-adrenergic receptor antagonists. Another 72 transplanted patients with voiding dysfunction after urethral catheter removal, who responded well to therapy with alpha-adrenergic blockers, were not included in this study. The underlying nephrologic conditions in study patients were chronic glomerulonephritis in 13 (54%), cystic kidney disease in four (17%), hypertensive nephropathy in three (13%), diabetic nephropathy in two (8%) and interstitial nephritis in two (8%) patients. The mean time on dialysis was 7.43 years (range from 4 months to 25 years). Twenty-two (92%) patients received first transplant and two (8%) patients second transplant. In one patient, kidney from a living donor was transplanted. Before renal transplantation, eight (33%) patients were anuric, 11 (46%) had diurnal urine volumes <500 mL, four (17%) had 500-1500 mL, and only one (4%) patient had normal urine production of >1.5 L/day. There was only one patient with evidence of BPH before transplantation.

After transplantation and urethral catheter removal on postoperative day 8 (day 11 in anuric patients before transplantation), the indications for re-catheterization were acute urinary retention in 17 (71%) and residual urine exceeding 300 mL in seven (29%) patients. Increased residual urine volume led to renal transplant dysfunction in two patients and to recurrent urinary tract infection in another three patients. All patients were treated with alpha-adrenergic blockers for at least 3 days, and the catheter was removed

again, unfortunately, with repeated urinary retention. Urethrocystoscopy revealed bladder neck contracture in nine and BPH in 15 patients, five of the latter with median prostatic lobe. TUIP was performed in 19 and TURP in five patients at a mean of 16.3 (12-29) days of transplantation. In all patients, surgical procedures were performed without any complication. Urethral catheter was removed at a mean of 3.3 (2-9) days after the procedure. The mean postoperative maximum flow rate was 17.4 mL/s (12-32) 10 days after the procedure and postvoiding residual urine was not significant. Surgical procedure for BOO did not alter renal function. All patients had the ureteral stent in place. Restoration of urinary bladder function was complete in all patients.

## Discussion

In recent years, the lower urinary tract, which collects urine from transplanted kidney has attracted little clinical and scientific attention, but low-pressure urine storage and effective bladder emptying with no residual volume is a prerequisite for prolonged and sufficient renal allograft function. There is no reason to suspect that the actual incidence of BOO should be greater in the renal transplant population. Frequency and nocturia are two main characteristics of lower urinary tract function after renal transplantation, probably through the combination of high fluid intake and long-term dysfunctional urinary bladder during renal replacement therapy.

Our data revealed a high rate of voiding dysfunction in male transplant recipients, and one quarter of our transplanted patients with voiding dysfunction required surgical treatment in the early posttransplant period. There are several reports of BOO from posttransplant BPH, and many of these patients required surgical procedures such as TUIP or TURP to alleviate urinary obstruction<sup>2-5</sup>. Urinary retention as evidenced by the high level of residual urine in our patients induced recurrent urinary tract infections and seriously affected graft function. In the renal transplant population, urinary tract infections have been shown to be an independent risk factor for graft loss<sup>6</sup>. Bladder neck and prostate-related surgeries were noted in 7% of our transplanted patients. This frequency is similar to that reported in the general population<sup>7</sup>.

There are no published studies of medical therapy for BOO in renal transplant patients, but this would be the first-line therapy as in the general population. Regarding surgical therapy, literature reports are conflicting when discussing whether it is better to perform TUIP or TURP procedure before or after transplantation. If performed before transplantation while the patient is still oliguric, urethral scarring may develop<sup>8</sup>. If performed after transplantation, there is a study report on 25% incidence of major postoperative complications including death<sup>5</sup>. Our experiences with TUIP as a minimally invasive surgical procedure, and TURP which was reserved only for patients with prostatic median lobe, were completely different. These procedures resulted in excellent restoration of urinary bladder function, without any complication in all our patients. Similar results with no complications have been reported by Koziolok *et al.*<sup>9</sup>. Although we had only one patient with evidence for BPH before transplantation, we strongly recommend evaluation for urologic abnormalities including BPH, bladder neck contracture or urethral stricture before transplant listing. This evaluation, of course, is only possible in patients with maintained urine production. Postvoid residual volume is an excellent objective screening test<sup>10</sup>. A small bladder, observed in eight of our patients, did not impair graft function postoperatively, and did achieve a favorable bladder capacity 2 months after transplantation. Another investigation of 102 patients showed the bladder capacity and compliance to have returned to normal in approximately 24 weeks of kidney transplantation<sup>11</sup>. The administration of alpha-adrenergic receptor antagonists before catheter removal in patients at risk may be useful because a high percentage of these patients develop postoperative voiding dysfunction. In patients having suffered from anuria for a long time before transplantation, we administered alpha-adrenergic blockers from posttransplant day 8 (3 days before urethral catheter removal) in order to reduce the risk of acute urinary retention and to enhance bladder neck relaxation. Further studies should evaluate whether it is better to prescribe these drugs routinely in older male recipients before removing urethral catheter.

Our data showed that TUIP or TURP could be safely performed early after renal transplantation in patients with repeated BOO who did not respond

to treatment with selective alpha-adrenergic receptor antagonists. These procedures should be reserved for transplanted patients with repeated acute urinary retention or residual urine volume, which leads to renal transplant dysfunction or recurrent urinary tract infections.

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## Sažetak

### TRANSURETRALNA INCIZIJA/RESEKCIJA PROSTATE (TUIP/TURP) U OPERACIJSKOM LIJEČENJU PONOVLJENE OPSTRUKCIJE VRATA MOKRAČNOG MJEHURA U RANOM RAZDOBLJU NAKON PRESADIJANJA BUBREGA

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Cilj rada bio je procijeniti incidenciju i etiologiju ponovljene opstrukcije vrata mokraćnog mjehura (BOO) nakon presađivanja bubrega i analizirati rezultate transuretralne incizije prostate (TUIP)/transuretralne resekcije prostate (TURP) u ranom razdoblju nakon presađivanja bubrega. Istraživanjem su obuhvaćena 24 bolesnika u kojih je učinjena transplantacija bubrega i transuretralni zahvati zbog BOO u ranom poslijetransplantacijskom razdoblju u našoj ustanovi između 2005. i 2011. godine. Ovisno o etiologiji BOO učinjen je TUIP ili TURP. Indikacije za transuretralni operacijski zahvat bile su: ponovljeno zadržavanje mokraće unatoč terapiji selektivnim antagonistima alfa adrenergičnih receptora ili ostatna mokraća s pogoršanjem funkcije bubrežnog presatka i/ili posljedičnom infekcijom mokraćnog sustava. Prijeoperacijska obrada uključivala je anamnezu, klinički pregled, PSA, određivanje volumena ostatne mokraće ultrazvukom i urinokulturu. Od 345 muška bolesnika podvrgnutih presađivanju bubrega u 24 bolesnika je zabilježena opetovana BOO. U 19 bolesnika je učinjen TUIP, a u 5 bolesnika TURP. Prosječna dob bolesnika bila je 52 (raspon 33-73) godine. Prosječno vrijeme provedeno na dijalizi iznosilo je 7,43 (raspon od 4 mjeseca do 25 godina) godine. Zahvat je učinjen 16. dana (14-29) nakon transplantacije. Urinarni kateter se vadio prosječno 3,3 (2-9) dana nakon zahvata. Uzrok BOO u 9 bolesnika je bila kontrakturna vrata mokraćnog mjehura, te hiperplazija prostate u 15 bolesnika. Zahvati su učinjeni bez ikakvih komplikacija u svih bolesnika. Ponovna uspostava funkcije mokraćnog mjehura bila je potpuna u svih bolesnika. U zaključku, rano transuretralno operacijsko zbrinjavanje opetovane BOO nakon transplantacije bubrega je siguran postupak koji daje izvrsne rezultate.

Ključne riječi: *Bubreg, transplantacija; Prostata, hiperplazija; Mokraćni mjehur, vrat, opstrukcija; Transuretralna resekcija prostate*